

EPA/OPP MICROBIOLOGY LABORATORY
ESC, Ft. Meade, MD

Standard Operating Procedure
for
Calibration of Kimble Class A Burets

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1.0 SCOPE AND APPLICATION:

- 1.1 This protocol describes the calibration method for 10 mL and 50 mL Kimble Class A burets. The calibration is done on an annual basis.

2.0 DEFINITIONS:

- 2.1 Calibration = The determination of the difference between the volume dispensed and the expected volume.
- 2.2 Adjustment = The correction of this difference between the measured value and the expected volume of the liquid displaced.
- 2.3 NIST= National Institute of Standards and Technology.

3.0 HEALTH AND SAFETY: Not applicable

4.0 CAUTIONS:

- 4.1 During calibration, the amount of water should be weighed immediately after being dispensed.
- 4.2 Burets should be inspected for chips and cracks prior to use.

5.0 INTERFERENCES:

- 5.1 It is important that the volumes of liquid are dispensed precisely, otherwise the entire calibration process can be impacted.

6.0 PERSONNEL QUALIFICATIONS:

- 6.1 Personnel are required to be knowledgeable of the procedures in this SOP.

7.0 SPECIAL APPARATUS AND MATERIALS:

- 7.1 Kimble Class A buret (10 mL) with 0.1 mL increments.
- 7.2 Kimble Class A buret (50 mL) with 1.0 mL increments.
- 7.3 Sartorius Basic Plus Model BP 211D (Serial Number 80904707): Weighs 0

to 40 / 80 / 210 g, reads to 0.00001 g or .01 mg, reproducibility \leq 0.02 / 0.05 / 0.1 mg (Manufacturer's Claims).

- 7.4 Sartorius Master^{Pro} Series Model LP 420 (Serial Number 81107148):
Weighs 0 to 420 g, reads to 0.01 g or 10 mg, reproducibility \leq 0.01 g (Manufacturer's Claims).

8.0 INSTRUMENT OR METHOD CALIBRATION:

- 8.1 The weigh balances are calibrated annually by a professional calibration service and are checked quarterly for accuracy using a reference weight set certified by NIST (see SOP EQ-03, Weigh Balances).

9.0 SAMPLE HANDLING AND STORAGE: Not applicable

10.0 PROCEDURE AND ANALYSIS:

- 10.1 Wash and rinse the buret with de-ionized water. Place a clean 50 mL beaker on the balance and tare it. Fill the buret with de-ionized water and adjust the level of the water to the zero mark while allowing the rest of the buret to become filled. Remove any air bubbles. Record the temperature of the water on the Calibration of Kimble Class A Buret Form (see 16.1).
- 10.2 For the 10 mL buret, dispense into the pre-tared beaker 5 serial aliquots (2 mL each) of water from the filled buret. Weigh the pre-tared beaker after the addition of each 2 mL aliquot. Record results on the Calibration of Kimble Class A Buret Form (see 16.1).
- 10.3 For the 50 mL buret, dispense into the pre-tared beaker 5 serial aliquots (10 mL each) of water from the filled buret. Weigh the pre-tared beaker after the addition of each 10 mL aliquot. Record results on the Calibration of Kimble Class A Buret Form (see 16.1).
- 10.4 Weights are plotted against the independent variable of the volume reading on the buret using Lotus 123 program.

11.0 DATA ANALYSIS/CALCULATIONS:

11.1 Simple linear regression is calculated by Lotus 123 and a correction factor is calculated using the slope and the intercept.

11.2 Corrected value for any volume (Y) dispensed by the buret is obtained by inserting the ml reading on the buret into the following equation:
$$Y = (\text{Co-efficient of } X) X - (\text{Constant})$$
The numbers are rounded to the first decimal place.

12.0 DATA MANAGEMENT/RECORDS MANAGEMENT:

12.1 Data will be recorded promptly, legibly and in indelible ink on the Calibration of Kimble Class A Buret Form. Completed forms are archived in notebooks kept in locked file cabinets in the file room D 217. Only authorized personnel have access to the locked files. Archived data is subject to OPP's official retention schedule contained in SOP ADM-03, Records and Archives.

13.0 QUALITY CONTROL:

13.1 The OPP Microbiology Laboratory conforms to 40 CFR Part 160 , Good Laboratory Practices. Appropriate quality control measures are integrated into each SOP.

13.2 The calibration of burets is performed annually and the information is documented on the appropriate record form(s) (see 16.1).

14.0 NONCONFORMANCE AND CORRECTIVE ACTION:

14.1 Burets exhibiting chips and cracks will not be used in the laboratory and will be discarded.

15.0 REFERENCES: None

16.0 FORMS AND DATA SHEETS:

16.1 Calibration of Kimble Class A Buret Form.

Calibration of Kimble Class A Buret OPP Microbiology Laboratory

Date/Initials_____ Temperature of Water_____
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10 mL Buret ID._____

Volume X (mL Buret)	Weight Y (gm)
2 ml	
4 mL	
6 mL	
8 mL	
10 mL	

50 mL Buret ID._____

Volume X (mL Buret)	Weight Y (gm)
10 mL	
20 mL	
30 mL	
40 mL	
50 mL	

In order to obtain the corrected value for any volume(Y) dispensed by this buret, simply enter the mL reading on the buret (X) into the following equation: $Y = (\text{Co-efficient of X}) X - 0 \text{ (Constant)}$.
Round off the number to the first decimal place.